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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/785,481	02/25/2004	Hisanori Nakajima	Q80099	1777

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SUGHRUE MION, PLLC
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Washington, DC 20037

EXAMINER

ZHU, RICHARD Z

ART UNIT	PAPER NUMBER
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2625

NOTIFICATION DATE	DELIVERY MODE
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10/23/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USPTO@sughrue.com
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Office Action Summary

Application No.

10/785,481

Applicant(s)

NAKAJIMA, HISANORI

Examiner

Richard Z. Zhu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2007 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on applications JP 2003-48823 filed in the Japanese Patent Office on February 26th 2003. Certified copies of said Japanese Application had been received.

Drawing Objections - 37 CFR 1.83

2. It appears to the examiner that the applicant's disclosure on Fig 10 and Pages 13-18 that the applicant is comparing the embodiment of present invention with a conventional set up, the comparative example of Fig 5, whereas Page 18 clearly illustrates the advantage of current disclosed invention relative to the comparative example.

As such, Figure 5 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2, 4-6, 8-10, and 12 are rejected under 35 USC 103 (a) as being unpatentable over *Silverbrook (US 5984446 A)* in view of *Goetz et al. (US 4978971 A)*.

Regarding the apparatus of Claim 5 and therefore method of Claim 1,

Silverbrook discloses a print control device (**Fig 11 (a), processor 1500**) for creating dot data representing recording states of ink dots (**Col 46, Rows 3-18**) in order to perform color printing by ejecting ink from nozzles of a print head (**Col 45, Rows 1-57, discloses the process in which contone color images are processed before printing is executed, all performed under the supervision of processor 1500**) during main scanning to thereby record ink dots on a printing medium (**Col 16, Rows 23-27, printhead 50 (see Fig 11 (a)) used for printing on recording medium 51**),

the print head having a plurality of nozzle groups (**Col 19, Rows 1-4, printhead 50 has a total of 79,488 nozzles**) for ejecting plural types of inks (**divided into groups to print six colors, CC'MM'YK, see Col 16, Rows 40-51**),

the print control device comprising:

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a first processor (Fig 11 (a), processor 1500 for performing a first process) for storing color image data (Col 45, Rows 8-17, **contone color images are written into contone buffer memory 1512**) for an area corresponding to a height of entire nozzles in the sub scanning direction (Col 24, Rows 63-65, **area A4 size paper corresponds to a height of 215mm**) that are used during color printing into a first buffer (Fig 11(a), **contone buffer memory 1512**);

a second processor (Fig 11 (a), processor 1500 for performing a second process) for selecting color image data that represent a color image part on a plurality of printing-subject lines subject to recording of ink dots performed by the plurality of nozzle groups during a single main scan from the first buffer (Fig 11(a), **from memory buffer 1512 to Expander & Halftoner 1527 and see Col 45, Rows 24-30, color image data are selected from the memory buffer 1512 for further processing**);

a third processor (Fig 11 (a), processor 1500 for performing a third process) for performing at least a halftone process that uses a threshold pattern (Col 42, Rows 26-29, **the preferred method of Halftoning is dispersed dot ordered dither, which is a type of Halftoning that requires the application of a threshold matrix to input values**) having a printing resolution on the selected color image data (Col 45, Rows 21-24, **the printing resolution appears to be 800 dpi**) on the plurality of printing-subject lines to create dot data representing recording states of ink dots in print pixels on the selected printing-subject lines (Col 45, Rows 26-32, **a Halftoning process, most preferably dispersed dot ordered dither, is applied to the image to create dot data. The state of ink dots being "0" for off**

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or “1” for on, as it is known in dither Halftoning), and storing the dot data into a second buffer (Fig 11(a), halftone band memory 1513); and

a fourth processor (Fig 11 (a), processor 1500 for performing a fourth process) for outputting the dot data from the second buffer (Col 45, Rows 50-57, halftoned data is read from halftone band memory 1513 to printhead 50).

Silverbrook does not expressly disclose that respectively, each of the plurality of nozzle groups including a plurality of nozzles whose nozzle pitch in a sub scanning direction is larger than a pitch of print pixels.

Goetz, in the same field that discloses an apparatus with a plurality of nozzle groups in a printhead with a controller (Fig 6) and with a reduced memory buffer size (Col 4, Rows 22-44), discloses that respectively, each of a plurality of nozzle groups (Fig 5, a printhead 60 have subheads 61, 62, and 63 or nozzle groups and see Col 5, Rows 52-60) including a plurality of nozzles whose nozzle pitch in a sub scanning direction is larger than a pitch of print pixels (Fig 5 and see Col 5, Rows 52-60, the pitch or distance between each nozzle is larger than the pitch or distance between the scan lines. It appears to the examiner Fig 5 is substantially the same as applicant's disclosed Fig 4).

It would've been obvious to one of ordinary skill in the art at the time of the invention to format the design of nozzle pitch relative to pitch of print pixels of *Silverbrook* in the manner of *Goetz* in order to provide “an apparatus and method for printing an image formed of pixels printed selectively at pixel locations over a predetermined area of a print medium,

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which pixel locations are distributed along lines having centers spaced a predetermined interline distance apart” (*Goetz*, Col 3, Rows 42-47).

Regarding the computer program product of Claim 9, *Silverbrook* discloses a computer program product for implementing the steps of Claim 1 and device of Claim 5 comprising:

a computer readable medium (Fig 11(a), Boot ROM 1504 and RAID 1055); and

a computer program (Col 44, Rows 20-24, main program stored on RAID 1055) stored on the computer readable medium for causing the processor to implement the functions of Claim 1 and Claim 5.

Regarding Claims 2, 6, and 10, *Silverbrook* discloses a print control device wherein the color image data have a lower resolution than the printing resolution (Col 45, Rows 21-24, color image data resolution is 266.6 dpi whereas printing resolution is 800 dpi).

Regarding Claims 4, 8, and 12, *Silverbrook* discloses a print control device wherein when print pixel positions on each printing-subject line subject to recording of ink dots during the single main scan include recording-subject pixel positions that are subject to recording of ink dots and non recording-subject pixel positions that are not subject to recording of ink dots during the single main scan, the third processor performs replacing values of dot data for the non recording-subject pixel positions among dot data on each printing-subject line with a value representing non-formation of dot (Col 42, Rows 26-29 and see Col 45, Rows 24-57. In the technique of dithering, it is known that when applying a threshold matrix comprising a plurality of threshold values to an multi-

gradation or tone image value; if the input value is below a certain threshold hold, a logic "0" or a value of dot data for non recording subject pixel position is generated. If the input value is above the threshold, a logic "1" or a value of data for recording subject pixel position is generated. As such, the Halftoning technique preferred by *Silverbrook* performed by the third processor discloses subjecting each printing-subject line to a process where replacing value of data for recording subject pixel position with a value representing formation of dots and replacing value of data for non-recording subject pixel position with a value representing non-formation of dots).

7. Claims 3, 7, and 11 are rejected under 35 USC 103 (a) as being unpatentable over *Silverbrook* (US 5984446 A) and *Goetz et al.* (US 4978971 A) in view of *Cheung et al* (US 5973803 A).

Silverbrook in view of *Goetz* discloses the subject matter from which Claims 3, 7, and 11 are dependent upon.

However, the combined reference does not disclose wherein the color image data stored into the first buffer are expressed in a first color system that uses three color components to express any colors, and the third processor performs conversion from the first color system to a second color system that uses the plural types of inks to express any colors prior to the halftone process.

Cheung, in the field of dither Halftoning (Col 8, Rows 35-49, in particular **Blue Noise Mask or Void and Cluster Mask are known variant of dither Halftoning**), discloses color image data are expressed in a first color system that uses three color components to express any colors (**Fig 2, RGB to CMY color conversion, image data are**

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initially in the form of RGB), and a processor for performing conversion from the first color system to a second color system (Fig 2, RGB to CMY color conversion 64 and CMY to CMYK conversion 68) that uses the plural types of inks to express any colors prior to the halftone process (Fig 2, dither Halftoning is executed after color conversion whereas in Col 9, Rows 16-20, CMY are known as subtractive primaries that is to be mixed together to form a much wider variety of colors. Col 9, Rows 22-29, RGB are known as subtractive secondary colors and when mixed together, they too produce a wider variety of colors).

It would've been obvious to one of ordinary skill in the art at the time of the invention to adopt the color Halftoning technique of *Cheung* into the combined system of *Silverbrook* in view of *Goetz* in order to consider the "combined number of dots from the color planes when determining the number of dots of each of the color planes and their locations for the output pattern to be made visually pleasing" (*Cheung*, Col 7, Rows 7-11)

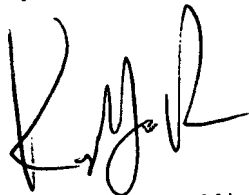
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Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US 5805178 A, US 6120129 A, and 6166828 A discloses apparatus and method of Halftoning printing with minimized buffer capacity.
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner's supervisor King Y. Poon whose telephone number is 571-272-7440 or examiner Richard Z. Zhu whose telephone number is 571-270-1587. Examiner Richard Zhu can normally be reached on Monday and Wednesday, 6:00 - 3:30, Tuesday and Thursday, 7:30-5:00, and alternate Friday, 7:30-4:00.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RZ²
10/15/2007



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